WHAT IS CLAIMED IS:

1. For use in a power system having a power train, a rectifier having an input and an output, said rectifier comprising:

switching circuitry coupled between said input and said output, said switching circuitry adapted to operate in selected one of (a) a bidirectional mode of operation and (b) an unidirectional mode of operation to rectify substantially alternating current at said input to produce substantially direct current at said output; and

control circuitry coupled to a control input of said switching circuitry, said control circuitry capable of sensing a characteristic of said power system and transitioning said switching circuitry between said bidirectional mode and said unidirectional mode as a function of said characteristic thereby to prevent substantial reverse power flow through said rectifier.

2. The rectifier as recited in Claim 1 wherein said switching circuitry comprises metal oxide semiconductor field effect transistor (MOSFET) switches.

3. The rectifier as recited in Claim 1 wherein said switching circuitry comprises a plurality of switches, said control circuitry capable of transitioning said switching circuitry between said bidirectional mode and said unidirectional mode by disabling all of said plurality of switches.

4. The rectifier as recited in Claim 1 wherein said power system comprises a second rectifier, said rectifier coupled in parallel with said second rectifier, said control circuitry substantially preventing said second rectifier from causing said substantial reverse power flow.

5. The rectifier as recited in Claim 1 wherein said switching circuitry comprises discrete diodes to allow said switching circuitry to operate in said unidirectional mode.

6. The rectifier as recited in Claim 1 wherein said characteristic of said power system is selected from the group consisting of:

a signal indicative of an output level of said rectifier,

an intermediate control signal of said power system,

an error signal of said power system,

a duty ratio of a switch associated with said power train, and

a period of time associated with an operation of said power system.

7. The rectifier as recited in Claim 1 further comprising a self-synchronized drive circuit adapted to provide a drive signal to said switching circuitry for varying a duty cycle of said switching circuitry as a function of said characteristic of said power system.

8. The rectifier as recited in Claim 1 wherein an active load-sharing circuit is coupled to said rectifier and a second rectifier to effect load sharing therebetween.

9. The rectifier as recited in Claim 1 wherein said control circuit transitions said switching circuitry from said bidirectional mode to said unidirectional mode when said characteristic of said power system drops below a predetermined threshold level.

10. The rectifier as recited in Claim 1 wherein said control circuitry is enabled only when said rectifier is coupled in parallel with a second rectifier.

11. For use in a power system having a power train, a method of controlling a rectifier having an input and an output, comprising the steps of:

rectifying substantially alternating current at said input to produce substantially direct current at said output with switching circuitry coupled between said input and said output, said switching circuitry adapted to operate in selected one of (a) a bidirectional mode of operation and (b) an unidirectional mode of operation; and

sensing a characteristic of said power system with control circuitry coupled to a control input of said switching circuitry, said control circuitry capable of transitioning said switching circuitry between said bidirectional mode and said unidirectional mode as a function of said characteristic thereby to prevent substantial reverse power flow through said rectifier.

12. The method as recited in Claim 11 wherein said switching circuitry comprises metal oxide semiconductor field effect transistor (MOSFET) switches.

13. The method as recited in Claim 11 wherein said switching circuitry comprises a plurality of switches, said control circuitry capable of transitioning said switching circuitry between said bidirectional mode and said unidirectional mode by disabling all of said plurality of switches.

14. The method as recited in Claim 11 wherein said power system comprises a second rectifier, the method further comprising the step of coupling said rectifier in parallel with said second rectifier, said control circuitry substantially preventing said second rectifier from causing said substantial reverse power flow.

15. The method as recited in Claim 11 further comprising the step of operating said switching circuitry in said unidirectional mode with discrete diodes in said switching circuitry.

16. The method as recited in Claim 11 wherein said step of sensing comprises the step of detecting said characteristic of said power system selected from the group consisting of:

a signal indicative of an output level of said rectifier,

an intermediate control signal of said power system,

an error signal of said power system,

a duty ratio of a switch associated with said power train, and

a period of time associated with an operation of said power system.

17. The method as recited in Claim 11 further comprising the step of providing a drive signal to said switching circuitry for varying a duty cycle of said switching circuitry as a function of said characteristic of said power system with a self-synchronized drive circuit.

18. The method as recited in Claim 11 further comprising the step of effecting load-sharing between said rectifier and a second rectifier with an active load-sharing circuit.

19. The method as recited in Claim 11 further comprising the step of transitioning said switching circuitry from said bidirectional mode to said unidirectional mode when said characteristic of said power system drops below a predetermined threshold level.

20. The method as recited in Claim 11 further comprising the step of enabling said control circuitry only when said rectifier is coupled in parallel with a second rectifier.

21. A power system having first and second rectifiers, each of said first and second rectifiers having an input and an output, each of said first and second rectifiers comprising:

switching circuitry comprising a plurality of diodes and switches coupled between said input and said output, said switching circuitry adapted to operate in selected one of (a) a bidirectional mode of operation and (b) an unidirectional mode of operation to rectify substantially alternating current at said input to produce substantially direct current at said output;

control circuitry coupled to a control input of said switching circuitry, said control circuitry capable of transitioning said switching circuitry between said bidirectional mode and said unidirectional mode as a function of a characteristic of said power system thereby to prevent one of said first and second rectifiers from creating substantial reverse power flow through another of said first and second rectifiers; and

an active load-sharing circuit coupled to said first and second rectifiers to effect load sharing therebetween.

22. The power system as recited in Claim 21 wherein said switching circuitry comprises a plurality of switches, said control circuitry capable of transitioning said switching circuitry between said bidirectional mode and said unidirectional mode by disabling all of said plurality of switches.

23. The power system as recited in Claim 21 wherein said control circuit transitions said switching circuitry from said bidirectional mode to said unidirectional mode when said characteristic of said power system drops below a predetermined threshold level.

24. The power system as recited in Claim 21 further comprising a self-synchronized drive circuit adapted to provide a drive signal to said switching circuitry for varying a duty cycle of said switching circuitry as a function of said characteristic of said power system.

25. The power system as recited in Claim 21 wherein said control circuitry comprises comparison circuitry for comparing said characteristic of said power system with a predetermined threshold level.

26. The rectifier as recited in Claim 21 wherein said control circuitry is enabled only when said rectifier is coupled in parallel with a second rectifier.